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Recommended Childhood and Adolescent Immunization Schedules—United States, 2012

COMMITTEE ON INFECTIOUS DISEASES

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POLICY STATEMENT

Recommended Childhood and Adolescent Immunization Schedules—United States, 2012

COMMITTEE ON INFECTIOUS DISEASES

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The 2012 recommended childhood and adolescent immunization schedules have been approved by the American Academy of Pediatrics, the Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention, and the American Academy of Family Physicians. Three schedules are provided: a schedule for children 0 through 6 years of age (Fig 1), a schedule for children 7 through 18 years of age (Fig 2), and a catch-up schedule for children and adolescents who start late or fall >1 month behind (Fig 3). An adult immunization schedule also is updated and published each year (www.cdc.gov/vaccines). Because of the increasing complexity of the vaccine schedule and the limited amount of space for footnotes, repetition between footnotes has been eliminated. Providers are advised to use all 3 schedules and their respective footnotes together, not as stand-alone schedules. These schedules are revised annually to reflect current recommendations for the use of vaccines licensed by the US Food and Drug Administration and include the following changes from last year:

- Clarification is provided for administration of hepatitis B vaccine and hepatitis B immune globulin to infants weighing <2000 g and for infants weighing ≥2000 g who are born to hepatitis B surface antigen-positive mothers. Clarification is provided for timing of doses after administration of the birth dose of hepatitis B vaccine.
- Clarification is provided for Tdap vaccine use for children 7 through 10 years who are not fully immunized with the childhood DTaP series.
- Guidance for the use of *Haemophilus influenzae* type b vaccine in people 5 years of age and older has been added to the catch-up schedule.
- Influenza vaccine footnotes have been updated to clarify vaccine dosing for children 6 months through 8 years of age for the 2011–2012 season. Guidance is provided on contraindications to the use of live-attenuated influenza vaccine.
- Guidance for the use of measles, mumps, and rubella vaccine in infants 6 through 11 months of age who are traveling internationally has been added.
- Hepatitis A footnotes have been clarified to emphasize administration of the second dose 6 to 18 months after the first dose. A new yellow and purple bar has been added to the “Recommended

immunization schedule for persons aged 0 through 6 years” to reflect hepatitis A vaccine recommendations for children 2 years of age and older.

- Guidance for routine administration of a booster dose of either meningococcal vaccine (MCV4) is provided. Guidance is provided for administration of MCV4 to children at increased risk of meningococcal disease. The MCV4 purple bar has been extended in the “Recommended immunization schedule for persons aged 0 through 6 years” to reflect licensure of MCV4-D (Menactra) use in children as young as 9 months.
- Human papillomavirus vaccine footnotes have been updated to include a routine recommendation for vaccination of males with quadrivalent human papillomavirus vaccine (Gardasil).
- Inactivated poliovirus vaccine footnotes have been updated to note that inactivated polio vaccine is not routinely recommended for US residents 18 years of age or older.

Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System. Guidance about

how to obtain and complete a Vaccine Adverse Event Reporting System form can be obtained on the Internet at www.vaers.hhs.gov or by calling 800-822-7967. Additional information can be found in the *Red Book*¹ and at *Red Book Online* (www.aapredbook.org). Statements from the Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention that contain details of recommendations for individual vaccines, including recommendations for children with high-risk conditions, are available at www.cdc.gov/vaccines/pubs/ACIP-list.htm. Information on new vaccine releases, vaccine supplies, interim recommendations resulting from vaccine shortages, and statements on specific vaccines can be found at www.aapredbook.org/news/vaccstatus.shtml and www.cdc.gov/vaccines/pubs/ACIP-list.htm.

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1. American Academy of Pediatrics. *Red Book: 2012 Report of the Committee on Infectious*

Diseases. Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. 29th ed. Elk Grove Village,

IL: American Academy of Pediatrics; 2012. In press

FIGURE 1
Recommended immunization schedule for persons aged 0 through 6 years—United States, 2012.

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	9 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years	
Hepatitis B ¹		Hep B	HepB			HepB		HepB						Range of recommended ages for all children
Rotavirus ²			RV	RV	RV ²									
Diphtheria, tetanus, pertussis ³			DTaP	DTaP	DTaP		see footnote ⁷	DTaP					DTaP	
<i>Haemophilus influenzae</i> type b ⁴			Hib	Hib	Hib ⁴			Hib						Range of recommended ages for certain high-risk groups
Pneumococcal ⁵			PCV	PCV	PCV			PCV				PPSV		
Inactivated poliovirus ⁶			IPV	IPV		IPV							IPV	
Influenza ⁷								Influenza (Yearly)						
Measles, mumps, rubella ⁸								MMR		see footnote ⁹			MMR	Range of recommended ages for all children and certain high-risk groups
Varicella ⁹								Varicella		see footnote ⁹			Varicella	
Hepatitis A ¹⁰								Dose 1 ¹⁰				HepA Series		
Meningococcal ¹¹								MCV4 — see footnote ¹¹						

This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

- Hepatitis B (HepB) vaccine.** (Minimum age: birth)
At birth:
 - Administer monovalent HepB vaccine to all newborns before hospital discharge.
 - For infants born to hepatitis B surface antigen (HBsAg)-positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after completion of at least 3 doses of the HepB series, at age 9 through 18 months (generally at the next well-child visit).
 - If mother's HBsAg status is unknown, within 12 hours of birth administer HepB vaccine for infants weighing $\geq 2,000$ grams, and HepB vaccine plus HBIG for infants weighing $< 2,000$ grams. Determine mother's HBsAg status as soon as possible and, if she is HBsAg-positive, administer HBIG for infants weighing $\geq 2,000$ grams (no later than age 1 week).**Doses after the birth dose:**
 - The second dose should be administered at age 1 to 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
 - Administration of a total of 4 doses of HepB vaccine is permissible when a combination vaccine containing HepB is administered after the birth dose.
 - Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine starting as soon as feasible (Figure 3).
 - The minimum interval between dose 1 and dose 2 is 4 weeks, and between dose 2 and 3 is 8 weeks. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks and at least 16 weeks after the first dose.
- Rotavirus (RV) vaccines.** (Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [Rota Teq])
 - The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants aged 15 weeks, 0 days or older.
 - If RV-1 (Rotarix) is administered at ages 2 and 4 months, a dose at 6 months is not indicated.
- Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.** (Minimum age: 6 weeks)
 - The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- Haemophilus influenzae* type b (Hib) conjugate vaccine.** (Minimum age: 6 weeks)
 - If PRP-OMP (PedvaxHIB or Comvax [HepB-Hib]) is administered at ages 2 and 4 months, a dose at age 6 months is not indicated.
 - Hiberix should only be used for the booster (final) dose in children aged 12 months through 4 years.
- Pneumococcal vaccines.** (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])
 - Administer 1 dose of PCV to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
 - For children who have received an age-appropriate series of 7-valent PCV (PCV7), a single supplemental dose of 13-valent PCV (PCV13) is recommended for:
 - All children aged 14 through 59 months
 - Children aged 60 through 71 months with underlying medical conditions.
 - Administer PPSV at least 8 weeks after last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant. See *MMWR* 2010;59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5911.pdf>.
- Inactivated poliovirus vaccine (IPV).** (Minimum age: 6 weeks)
 - If 4 or more doses are administered before age 4 years, an additional dose should be administered at age 4 through 6 years.
 - The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.
- Influenza vaccines.** (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 2 years for live, attenuated influenza vaccine [LAIV])
 - For most healthy children aged 2 years and older, either LAIV or TIV may be used. However, LAIV should not be administered to some children, including 1) children with asthma, 2) children 2 through 4 years who had wheezing in the past 12 months, or 3) children who have any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5908.pdf>.
 - For children aged 6 months through 8 years:
 - For the 2011–12 season, administer 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11 vaccine. Those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season.
 - For the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.
- Measles, mumps, and rubella (MMR) vaccine.** (Minimum age: 12 months)
 - The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
 - Administer MMR vaccine to infants aged 6 through 11 months who are traveling internationally. These children should be revaccinated with 2 doses of MMR vaccine, the first at ages 12 through 15 months and at least 4 weeks after the previous dose, and the second at ages 4 through 6 years.
- Varicella (VAR) vaccine.** (Minimum age: 12 months)
 - The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose.
 - For children aged 12 months through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
- Hepatitis A (HepA) vaccine.** (Minimum age: 12 months)
 - Administer the second (final) dose 6 to 18 months after the first.
 - Unvaccinated children 24 months and older at high risk should be vaccinated. See *MMWR* 2006;55(No. RR-7), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5507.pdf>.
 - A 2-dose HepA vaccine series is recommended for anyone aged 24 months and older, previously unvaccinated, for whom immunity against hepatitis A virus infection is desired.
- Meningococcal conjugate vaccines, quadrivalent (MCV4).** (Minimum age: 9 months for Menactra [MCV4-D], 2 years for Menveo [MCV4-CRM])
 - For children aged 9 through 23 months 1) with persistent complement component deficiency; 2) who are residents of or travelers to countries with hyperendemic or epidemic disease; or 3) who are present during outbreaks caused by a vaccine serogroup, administer 2 primary doses of MCV4-D, ideally at ages 9 months and 12 months or at least 8 weeks apart.
 - For children aged 24 months and older with 1) persistent complement component deficiency who have not been previously vaccinated; or 2) anatomic/functional asplenia, administer 2 primary doses of either MCV4 at least 8 weeks apart.
 - For children with anatomic/functional asplenia, if MCV4-D (Menactra) is used, administer at a minimum age of 2 years and at least 4 weeks after completion of all PCV doses.
 - See *MMWR* 2011;60:72–6, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6003.pdf>, and Vaccines for Children Program resolution No. 6/11-1, available at <http://www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf>, and *MMWR* 2011;60:1391–2, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6040.pdf>, for further guidance, including revaccination guidelines.

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).
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FIGURE 2
Recommended immunization schedule for persons aged 7 through 18 years—United States, 2012.

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years	
Tetanus, diphtheria, pertussis ¹		1 dose (if indicated)	1 dose	1 dose (if indicated)	Range of recommended ages for all children
Human papillomavirus ²		See footnote ²	3 doses	Complete 3-dose series	
Meningococcal ³		See footnote ³	Dose 1	Booster at age 16 years	
Influenza ⁴		Influenza (yearly)			Range of recommended ages for catch-up immunization
Pneumococcal ⁵		See footnote ⁵			
Hepatitis A ⁶		Complete 2-dose series			
Hepatitis B ⁷		Complete 3-dose series			Range of recommended ages for certain high-risk group
Inactivated poliovirus ⁸		Complete 3-dose series			
Measles, mumps, rubella ⁹		Complete 2-dose series			
Varicella ¹⁰		Complete 2-dose series			

This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

- 1. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine.** (Minimum age: 10 years for Boostrix and 11 years for Adacel)

 - Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
 - Tdap vaccine should be substituted for a single dose of Td in the catch-up series for children aged 7 through 10 years. Refer to the catch-up schedule if additional doses of tetanus and diphtheria toxoid-containing vaccine are needed.
 - Tdap vaccine can be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.

2. Human papillomavirus (HPV) vaccines (HPV4 [Gardasil] and HPV2 [Cervarix]). (Minimum age: 9 years)

 - Either HPV4 or HPV2 is recommended in a 3-dose series for females aged 11 or 12 years. HPV4 is recommended in a 3-dose series for males aged 11 or 12 years.
 - The vaccine series can be started beginning at age 9 years.
 - Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
 - See *MMWR* 2010;59:626–32, available at <http://www.cdc.gov/mmwr/pdf/wk/mm5920.pdf>.

3. Meningococcal conjugate vaccines, quadrivalent (MCV4).

 - Administer MCV4 at age 11 through 12 years with a booster dose at age 16 years.
 - Administer MCV4 at age 13 through 18 years if patient is not previously vaccinated.
 - If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years with a minimum interval of at least 8 weeks after the preceding dose.
 - If the first dose is administered at age 16 years or older, a booster dose is not needed.
 - Administer 2 primary doses at least 8 weeks apart to previously unvaccinated persons with persistent complement component deficiency or anatomic/functional asplenia, and 1 dose every 5 years thereafter.
 - Adolescents aged 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of MCV4, at least 8 weeks apart.
 - See *MMWR* 2011;60:72–76, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6003.pdf>, and Vaccines for Children Program resolution No. 6/11-1, available at <http://www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf>, for further guidelines.

4. Influenza vaccines (trivalent inactivated influenza vaccine [TIV] and live, attenuated influenza vaccine [LAIV]).

 - For most healthy, nonpregnant persons, either LAIV or TIV may be used, except LAIV should not be used for some persons, including those with asthma or any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5908.pdf>.
 - Administer 1 dose to persons aged 9 years and older.
 - For children aged 6 months through 8 years:
 - For the 2011–12 season, administer 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11 vaccine. Those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season.
 - For the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.
- 5. Pneumococcal vaccines (pneumococcal conjugate vaccine [PCV] and pneumococcal polysaccharide vaccine [PPSV]).**

 - A single dose of PCV may be administered to children aged 6 through 18 years who have anatomic/functional asplenia, HIV infection or other immunocompromising condition, cochlear implant, or cerebral spinal fluid leak. See *MMWR* 2010;59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5911.pdf>.
 - Administer PPSV at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant. A single revaccination should be administered after 5 years to children with anatomic/functional asplenia or an immunocompromising condition.

6. Hepatitis A (HepA) vaccine.

 - HepA vaccine is recommended for children older than 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A virus infection is desired. See *MMWR* 2006;55(No. RR-7), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5507.pdf>.
 - Administer 2 doses at least 6 months apart to unvaccinated persons.

7. Hepatitis B (HepB) vaccine.

 - Administer the 3-dose series to those not previously vaccinated.
 - For those with incomplete vaccination, follow the catch-up recommendations (Figure 3).
 - A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children aged 11 through 15 years.

8. Inactivated poliovirus vaccine (IPV).

 - The final dose in the series should be administered at least 6 months after the previous dose.
 - If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
 - IPV is not routinely recommended for U.S. residents aged 18 years or older.

9. Measles, mumps, and rubella (MMR) vaccine.

 - The minimum interval between the 2 doses of MMR vaccine is 4 weeks.

10. Varicella (VAR) vaccine.

 - For persons without evidence of immunity (see *MMWR* 2007;56[No. RR-4], available at <http://www.cdc.gov/mmwr/pdf/rr/rr5604.pdf>), administer 2 doses if not previously vaccinated or the second dose if only 1 dose has been administered.
 - For persons aged 7 through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
 - For persons aged 13 years and older, the minimum interval between doses is 4 weeks.

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).

FIGURE 3
Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind—United States • 2012.

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with the accompanying childhood and adolescent immunization schedules (Figures 1 and 2) and their respective footnotes.**

Persons aged 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus ¹	6 weeks	4 weeks	4 weeks ¹		
Diphtheria, tetanus, pertussis ²	6 weeks	4 weeks	4 weeks	6 months	6 months ²
<i>Haemophilus influenzae</i> type b ³	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose) if first dose administered at age 12–14 months No further doses needed if first dose administered at age 15 months or older	4 weeks ³ if current age is younger than 12 months 8 weeks (as final dose) ³ if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	
Pneumococcal ⁴	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks	6 months ⁵ minimum age 4 years for final dose	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months			
Hepatitis A	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria/ tetanus, diphtheria, pertussis ⁹	7 years ⁹	4 weeks	4 weeks if first dose administered at younger than age 12 months 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human papillomavirus ¹⁰	9 years	Routine dosing intervals are recommended ¹⁰			
Hepatitis A	12 months	6 months			
Hepatitis B	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks ⁵	6 months ⁵	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

1. **Rotavirus (RV) vaccines (RV-1 [Rotarix] and RV-5 [Rota Teq]).**
 - The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants aged 15 weeks, 0 days or older.
 - If RV-1 was administered for the first and second doses, a third dose is not indicated.

2. **Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.**
 - The fifth dose is not necessary if the fourth dose was administered at age 4 years or older.

3. ***Haemophilus influenzae* type b (Hib) conjugate vaccine.**
 - Hib vaccine should be considered for unvaccinated persons aged 5 years or older who have sickle cell disease, leukemia, human immunodeficiency virus (HIV) infection, or anatomic/functional asplenia.
 - If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax) and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
 - If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months.

4. **Pneumococcal vaccines.** (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])
 - For children aged 24 through 71 months with underlying medical conditions, administer 1 dose of PCV if 3 doses of PCV were received previously, or administer 2 doses of PCV at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
 - A single dose of PCV may be administered to certain children aged 6 through 18 years with underlying medical conditions. See age-specific schedules for details.
 - Administer PPSV to children aged 2 years or older with certain underlying medical conditions. See *MMWR* 2010:59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/rr5911.pdf>.
5. **Inactivated poliovirus vaccine (IPV).**
 - A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.
 - In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
 - IPV is not routinely recommended for U.S. residents aged 18 years or older.

6. **Meningococcal conjugate vaccines, quadrivalent (MCV4).** (Minimum age: 9 months for Menactra [MCV4-D]; 2 years for Menveo [MCV4-CRM])
 - See Figure 1 ("Recommended immunization schedule for persons aged 0 through 6 years") and Figure 2 ("Recommended immunization schedule for persons aged 7 through 18 years") for further guidance.

7. **Measles, mumps, and rubella (MMR) vaccine.**
 - Administer the second dose routinely at age 4 through 6 years.

8. **Varicella (VAR) vaccine.**
 - Administer the second dose routinely at age 4 through 6 years. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.

9. **Tetanus and diphtheria toxoids (Td) and tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccines.**
 - For children aged 7 through 10 years who are not fully immunized with the childhood DTaP vaccine series, Tdap vaccine should be substituted for a single dose of Td vaccine in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine dose should not be given.
 - An inadvertent dose of DTaP vaccine administered to children aged 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.

10. **Human papillomavirus (HPV) vaccines (HPV4 [Gardasil] and HPV2 [Cervarix]).**
 - Administer the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if patient is not previously vaccinated.
 - Use recommended routine dosing intervals for vaccine series catch-up; see Figure 2 ("Recommended immunization schedule for persons aged 7 through 18 years").

Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (<http://www.cdc.gov/vaccines>) or by telephone (800-CDC-INFO [800-232-4636]).

ERRATA

Flick et al. Cognitive and Behavioral Outcomes After Early Exposure to Anesthesia and Surgery. *Pediatrics*. 2011;128(5):e1053–e1061

An error occurred in this article by Flick et al, titled: “Cognitive and Behavioral Outcomes After Early Exposure to Anesthesia and Surgery” published in the November 2011 issue of *Pediatrics* (2011;128[5]: e1053–e1061; originally published online October 3, 2011; doi:10.1542/peds.2011-0351). On page e1054, in the Introduction, paragraph 1, line 5, this reads: “drugs include *N*-methyl-D-aspartate glutamate receptor agonists and γ -aminobutyric acid antagonists.” This should have read: “drugs include *N*-methyl-D-aspartate glutamate receptor antagonists and γ -aminobutyric acid agonists.”

doi:10.1542/peds.2011-3305

American Academy of Pediatrics. Prevention and Management of Positional Skull Deformities in Infants. *Pediatrics*. 2011;128(6):1236–1241

An error occurred in the American Academy of Pediatrics clinical report “Prevention and Management of Positional Skull Deformities in Infants” published in the December 2011 issue of *Pediatrics* (2011;128[6]:1236–1241; originally published online November 28, 2011; doi: 10.1542/peds.2011-2220). On page 1237, third column under Prevention, the fourth sentence should read: “Prolonged placement indoors in car safety seats and swings should be discouraged.” We regret the error.

doi:10.1542/peds.2011-3592

American Academy of Pediatrics. Health Care for Youth in the Juvenile Justice System. *Pediatrics*. 2011;128(6):1219–1235

An error occurred in the American Academy of Pediatrics policy statement “Health Care for Youth in the Juvenile Justice System” published in the December 2011 issue of *Pediatrics* (2011;128[6]:1219–1235; originally published online November 28, 2011; doi: 10.1542/peds.2011-1757). On page 1219, the number of arrests cited in the first sentence under the heading “Epidemiology of Juvenile Arrests” was inadvertently printed incorrectly. It should read: “In 2008, approximately 2.11 million juveniles younger than age 18 were arrested.”⁷ We regret the error.

doi:10.1542/peds.2011-3723

Chippis B et al. Longitudinal Validation of the Test for Respiratory and Asthma Control in Kids in Pediatric Practices. *Pediatrics*. 2011;127(3):e717–e747

An error occurred in this article by Chippis B et al, titled “Longitudinal Validation of the Test for Respiratory and Asthma Control in Kids in Pediatric Practices” published in the March 2011 issue of *Pediatrics* (2011;127[3]: e737–e747; originally published online February 21, 2011; doi: 10.1542/peds.2010-1465) on page e738, Fig 1, Questions 3 and 5. This figure shows the Test for Respiratory and Asthma Control in Kids (TRACK) tool. Question 3 states, “During the past 4 weeks, to what extent did your child’s breathing problems, such as wheezing, coughing, or shortness of breath, interfere with his or her ability to play, go to school, or engage in usual activities that a child should be doing at his or her age.” The correct answer choices are “Not at all,” “Slightly,” “Moderately,” “Quite a lot,” and “Extremely.” Question 5 states, “During the past 12 months, how often did your child need to take oral corticosteroids (prednisone, prednisolone, Orapred®, Prelone®, or Decadron®) for breathing problems not controlled by other medications?” The

correct answer choices are “Never,” “Once,” “Twice,” “3 times,” and “4 or more times.” The corrected Fig 1 follows.

In the Acknowledgments, the correct spelling for the writer who provided editorial assistance is Hema Gowda, PharmD.

doi:10.1542/peds.2011-3725

1. During the <u>past 4 weeks</u> , how often was your child bothered by breathing problems, such as wheezing, coughing, or shortness of breath?	Score
Not at all <input type="checkbox"/> 20	Once or twice <input type="checkbox"/> 15
Once every week <input type="checkbox"/> 10	2 or 3 times a week <input type="checkbox"/> 5
4 or more times a week <input type="checkbox"/> 0	<input type="text"/>
2. During the <u>past 4 weeks</u> , how often did your child's breathing problems (wheezing, coughing, shortness of breath) wake him or her up at night?	<input type="text"/>
Not at all <input type="checkbox"/> 20	Once or twice <input type="checkbox"/> 15
Once every week <input type="checkbox"/> 10	2 or 3 times a week <input type="checkbox"/> 5
4 or more times a week <input type="checkbox"/> 0	<input type="text"/>
3. During the <u>past 4 weeks</u> , to what extent did your child's breathing problems, such as wheezing, coughing, or shortness of breath, interfere with his or her ability to play, go to school, or engage in usual activities that a child should be doing at his or her age?	<input type="text"/>
Not at all <input type="checkbox"/> 20	Slightly <input type="checkbox"/> 15
Moderately <input type="checkbox"/> 10	Quite a lot <input type="checkbox"/> 5
Extremely <input type="checkbox"/> 0	<input type="text"/>
4. During the <u>past 3 months</u> , how often did you need to treat your child's breathing problems (wheezing, coughing, shortness of breath) with quick-relief medications (albuterol, Ventolin®, Proventil®, Maxair®, ProAir®, Xopenex®, or Primatene® Mist)?	<input type="text"/>
Not at all <input type="checkbox"/> 20	Once or twice <input type="checkbox"/> 15
Once every week <input type="checkbox"/> 10	2 or 3 times a week <input type="checkbox"/> 5
4 or more times a week <input type="checkbox"/> 0	<input type="text"/>
5. During the <u>past 12 months</u> , how often did your child need to take oral corticosteroids (prednisone, prednisolone, Orapred®, Prelone®, or Decadron®) for breathing problems not controlled by other medications?	<input type="text"/>
Never <input type="checkbox"/> 20	Once <input type="checkbox"/> 15
Twice <input type="checkbox"/> 10	3 times <input type="checkbox"/> 5
4 or more times <input type="checkbox"/> 0	<input type="text"/>
Other brands mentioned herein are trademarks of their respective owners and are not trademarks of the AstraZeneca group of companies. The makers of these brands are not affiliated with and do not endorse AstraZeneca or its products.	Total <input type="text"/>

FIGURE 1
Test for Respiratory and Asthma Control in Kids (TRACK). TRACK is a trademark of the AstraZeneca group of companies. (c)2009 AstraZeneca LP. All rights reserved 278650 5/09.

American Academy of Pediatrics. Recommended Childhood and Adolescent Immunization Schedules—United States, 2012. *Pediatrics*. 2012;129(2):385–386

A minor clarification has been made in the American Academy of Pediatrics policy statement “Recommended Childhood and Adolescent Immunization Schedules—United States, 2012” published in the February 2012 issue of *Pediatrics* (2012;129 [2]:385–386; doi:10.1542/peds.2011-3630). In Fig 3: Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind—United States, 2012, the bullet in footnote 9 that previously read:

Inadvertent doses of DTaP vaccine are counted as part of the Td/Tdap vaccine series.

now reads:

An inadvertent dose of DTaP vaccine administered to children aged 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.

and appears as the first bullet rather than the second (ie, the 2 bullets have switched positions).

The corrected schedule is now posted online at <http://pediatrics.aappublications.org/> and *Red Book Online*. Please note that it will differ from the version that appeared in the print journal.

doi:10.1542/peds.2012-0319

ERRATA

American Academy of Pediatrics. School-Based Health Centers and Pediatric Practice. *Pediatrics*. 2012;129(2):387–393

An error occurred in the American Academy of Pediatrics policy statement “School-Based Health Centers and Pediatric Practice” published in the February 2012 issue of *Pediatrics* (2012;129[2]:387–393; originally published online January 30, 2012; doi: 10.1542/peds.2011-3443). On page 390, in Challenge No. 5, the organization listed as National Association for School-Based Health Centers should have been National Assembly on School-Based Health Care. We regret the error.

doi:10.1542/peds.2012-0389

American Academy of Pediatrics. Recommended Childhood and Adolescent Immunization Schedules—United States, 2012. *Pediatrics*. 2012;129(2):385–386

A minor clarification has been made in the American Academy of Pediatrics policy statement “Recommended Childhood and Adolescent Immunization Schedules—United States, 2012” published in the February 2012 issue of *Pediatrics* (2012;129[2]:385–386; doi:10.1542/peds.2011-3630). In Fig 1: Recommended immunization schedule for persons aged 0 through 6 years—United States, 2012, the second bullet in footnote 1 regarding hepatitis B immunization should read, “For infants born to hepatitis B surface antigen (HBsAg)–positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after completion of at least 3 doses of the HepB series, at age 9 through 18 months (generally at the next well-child visit).”

The corrected schedule is now posted online at <http://pediatrics.aappublications.org/> and *Red Book Online*. Please note that it will differ from the version that appeared in the print journal.

doi:10.1542/peds.2012-0609

Recommended Childhood and Adolescent Immunization Schedules--United States, 2012

COMMITTEE ON INFECTIOUS DISEASES

Pediatrics 2012;129:385

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Errata

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